# THE HEALTH CONSEQUENCES OF SMOKING FOR WOMEN

*a report of the Surgeon General*

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Office of the Assistant Secretary for Health
Office on Smoking and Health

THE SECRETARY OF HEALTH, EDUCATION, AND WELFARE
WASHINGTON, D.C. 20201

The Honorable Thomas P. O'Neill,Jr.
Speaker of the House of Representatives
Washington, D.C. 20515

Dear Mr. Speaker:

I hereby submit the 12th annual report that the Department of Health, Education, and Welfare (DHEW) has prepared for Congress as required by the Public Health Cigarette Smoking Act of 1969, Public Law 91-222, and its predecessor, the Federal Cigarette Labeling and Advertising Act. This report is one of the most alarming in the series.

It clearly establishes that women smokers face the same risks as men smokers of lung cancer, heart disease, lung disease and other consequences. Perhaps more disheartening is the harm which mothers' smoking causes to their unborn babies and infants.

The report is not all bad news. It presents recent data showing that women are turning away from smoking in response to the warnings of government, voluntary agencies and physicians. The precipitate rise in women's deaths from lung cancer and chronic lung disease demand that this trend away from cigarettes be accelerated. Our scientists expect that by 1983, the lung cancer death rate will exceed that of any other type of cancer among women.

Citizens of our free society may decide for themselves whether to smoke cigarettes. The health consequences of this decision make it imperative for their government to assure that the decision is an informed one. This series of reports is one way in which DHEW is striving to meet this critical responsibility.

Sincerely yours,

Patricia Roberts Harris

## PREFACE

This report is more than a factual review of the health consequences of smoking for women. It is a document which challenges our society and, in particular, our medical and public health communities.

This report points out that the first signs of an epidemic of smoking-related disease among women are now appearing. Because women's cigarette use did not become widespread until the onset of World War II, those women with the greatest intensity of smoking are now only in their thirties, forties, and fifties. As these women grow older, and continue to smoke, their burden of smoking-related disease will grow larger. Cigarette smoking now contributes to one-fifth of the newly diagnosed cases of cancer and one-quarter of all cancer deaths among women—more cancer and more cancer deaths among women than can be attributed to any other known agent. Within three years, the lung cancer death rate is expected to surpass that for breast cancer. A similar epidemic of chronic obstructive lung disease among women has also begun.

Four main themes emerge from this report to guide future public health efforts.

First, women are not immune to the damaging effects of smoking already documented for men. The apparently lower susceptibility to smoking-related diseases among women smokers is an illusion reflecting the fact that women lagged one-quarter century behind men in their widespread use of cigarettes.

Second, cigarette smoking is a major threat to the outcome of pregnancy and well-being of the newborn baby.

Third, women may not start smoking, continue to smoke, quit smoking, or fail to quit smoking for precisely the same reasons as men. Unless future research clarifies these differences, we will find it difficult to prevent initiation or to promote cessation of cigarette smoking among women.

Fourth, the reduction of cigarette smoking is the keystone in our nation's long term strategy to promote a healthy lifestyle for women and men of all races and ethnic groups.

### The Fallacy of Women's Immunity

All of the major prospective studies of smoking and mortality have reached consistent conclusions. Death rates from coronary heart disease, chronic lung disease, lung cancer, and overall mortality rates are significantly increased among both women and men smokers. These risks increase with the amount smoked, duration of smoking, depth of inhalation, and the "tar"

and nicotine delivery of the cigarette smoked.

In these studies, conducted during the past three decades, relative mortality risks among female smokers appeared to be less than those of male smokers. It is now clear, however, that these studies were comparing the death rates of a generation of established, lifelong male smokers with a generation of women who had not yet taken up smoking with full intensity. Even those older women who reported smoking a large number of cigarettes per day had not smoked cigarettes in the same way as their male counterparts. Now that the cigarette smoking characteristics of women and men are becoming increasingly similar, their relative risks of smoking-related illness will become increasingly similar.

This fallacy of women's apparent immunity is clearly illustrated by differences in the timing of the growth in lung cancer among men and women in this century. Lung cancer deaths among males began to increase during the 1930s, as those men who had converted from other forms of tobacco to cigarette smoking before the turn of the century gradually accumulated decades of inhaled tobacco exposure. By the time of the first retrospective studies of smoking and lung cancer in 1950, two entire generations of men had already become lifelong cigarette smokers. Relatively few women from these generations smoked cigarettes, and even fewer had smoked cigarettes since their adolescence. Those young women who had taken up smoking intensively during World War II were only in their twenties and thirties. In 1950, women accounted for less than one in twelve deaths from lung cancer.

Thereafter, the age adjusted lung cancer death rate among women accelerated, and the male predominance in lung cancer declined. Lung cancer surpassed uterine cervical cancer as a cause of death in women. By 1968, as the findings of many large population prospective studies were being published, women accounted for one-sixth of all lung cancer deaths. These studies found that women cigarette smokers had 2.5 to 5 times greater death rates from lung cancer than women nonsmokers. By 1979, women accounted for fully one-fourth of all lung cancer deaths. Over the next few years, women cigarette smokers' risk of lung cancer death will approach 8 to 12 times that of women nonsmokers, the same relative risk as that of men.

Lung cancer has four main histological types: epidermoid, small cell, adenocarcinoma, and large cell carcinoma, As several studies have shown, the incidence of each of these types of lung cancer displays a clear relationship to cigarette smoking among both men and women. Epidermoid and small cell lung cancer appear to be more prominent among men, while adenocar-

cinoma of the lung now appears to be more prominent among women.

The recent acceleration of lung cancer incidence among women has in fact been more rapid than the corresponding growth of lung cancer among men in the 1930s. Again, this difference in the initial rate of acceleration of lung cancer incidence does not refute the demonstrated causal relation between cigarette smoking and lung cancer among both sexes. Instead, differences in the rate of increase of lung cancer incidence may reflect changes in the carcinogenic properties of cigarette smoke, the style of cigarette smoking, or the interaction of cigarette smoking with other environmental hazards. It is noteworthy that those men who died of lung cancer in the 1930s came from a generation that had gradually converted to cigarettes from other, non-inhaled forms of tobacco. By contrast, the first regular tobacco users among women were almost exclusively cigarette smokers.

The 1979 Report on Smoking and Health documented numerous instances where cigarette smoking adds to the hazards of the workplace environment among men. Among women, this report reveals two such occupational exposures—asbestos and cotton dust—which have been clearly demonstrated to interact with cigarette smoking. The fact that evidence is limited among women does not imply that women are protected from the dangerous interactions of smoking and occupational exposures.

**Pregnancy, Infant Health, and Reproduction**

Scientific studies encompassing various races and ethnic groups, cultures and countries, involving hundreds of thousands of pregnancies, have shown that cigarette smoking during pregnancy significantly affects the unborn fetus and the newborn baby. These damaging effects have been repeatedly shown to operate independently of all other factors that influence the outcome of pregnancy. The effects are increased by heavier smoking and are reduced if a woman stops smoking during pregnancy.

Numerous toxic substances in cigarette smoke, such as nicotine and hydrogen cyanide, cross the placenta to affect the fetus directly. The carbon monoxide from cigarette smoke is transported into the fetal blood and deprives the growing baby of oxygen. Fetal growth is directly retarded. The resulting reduction in fetal weight and size has many unfortunate consequences. Women who smoke cigarettes during pregnancy have more spontaneous abortions, and a greater incidence of bleeding during pregnancy, premature and prolonged rupture of am-

niotic membranes, abruptio placentae and placenta previa. Women who smoke cigarettes during pregnancy have more fetal and neonatal deaths than nonsmoking pregnant women. A relation between maternal smoking and Sudden Infant Death Syndrome has now been established.

The direct harmful effects of smoking on the fetus have long term consequences. Children of mothers who smoked during pregnancy lag measurably in physical growth; there may also be effects on behavior and cognitive development. The extent of these deficiencies increases with the number of cigarettes smoked.

The damaging effects of maternal smoking on infants are not restricted to pregnancy. Nicotine, a known poison, is found in the breast milk of smoking mothers. Children whose parents smoke cigarettes have more respiratory infections and more hospitalizations in the first year of life.

Women who smoke cigarettes have more than three times the risk of dying of stroke due to subarachnoid hemorrhage, and as much as two times the risk of dying of heart attack in comparison to nonsmoking women. The use of oral contraceptives in addition to smoking, however, causes a markedly increased risk, including a 22-fold increase in the risk of subarachnoid hemorrhagic stroke and a 20-fold increase in heart attack in heavy smokers.

**Why Do Women Smoke?**

Cigarette consumption in this country is now declining. Annual per capita consumption has decreased from 4,258 in 1965 to an estimated 3,900 in 1979. From 1965 to 1979, the proportion of adult male cigarette smokers declined from 51 to 37 percent. Not only have millions of men quit smoking, but the rate of initiation of smoking among adolescent males has now slowed.

From 1965 to 1976, the proportion of adult women cigarette smokers remained virtually unchanged at 32 to 33 percent. Since 1976, however, the proportion of adult women cigarette smokers appears to have declined to 28 percent. Although adult women are now beginning to quit smoking at rates comparable to adult men, the rate of initiation of smoking among younger women has not declined.

This report documents numerous differences by sex in the perceived role of cigarette smoking, in attitudes toward health and lifestyle, and in methods of coping with stress, anger, and boredom. Yet the significance of these differences, and their relation to differences in smoking patterns, remains poorly understood.

Although it is frequently observed that women in organized smoking cessation programs have more severe withdrawal symptoms and lower rates of successful quitting than men, these observations have not been systematically confirmed for the general population. In the past, women may have attempted to quit or succeeded in quitting smoking less frequently than men. The recent decline in the proportion of women smokers, however, suggests that women's attempted and successful quitting rates have now increased.

Although weight gain is a frequently cited consequence of quitting smoking, the association of weight gain with cessation of smoking has not been the subject of sufficient scrutiny. Controlled studies with careful measurement on representative populations of women do not exist. The impact of the fear of weight gain after quitting has not been adequately examined. If weight gain does result from cessation of smoking, its exact mechanism must be determined.

Even more problematic are marked differences by sex in the distribution of smoking prevalence by occupation. Men with advanced education and professional occupations have taken the lead in quitting smoking, but women in administrative and managerial positions have relatively high smoking prevalence rates. Although 20 percent or fewer male physicians smoke, the proportions of cigarette smokers among women health professionals, especially nurses and psychologists, remain disturbingly high.

Recent changes in smoking prevalence among black women and men have paralleled those of the general population. From 1965 to 1979, the proportion of black women cigarette smokers declined from 34 to 29 percent, while the proportion of black men smokers declined from 61 to 42 percent. However, differences by race in the onset, maintenance, and cessation of smoking have not been adequately explored. Little is known about cigarette smoking among other ethnic and minority groups.

### Adolescent Smoking

The health consequences of smoking evolve over a lifetime. Evidence continues to accumulate, for example, that cigarette smoking produces measurable lung changes in adolescence and young adulthood. Young cigarette smokers of both sexes show more evidence of small airway dysfunction, and a higher prevalence of cough, wheezing, phlegm production, and other respiratory symptoms. The health damage due to cigarette smoking increases when an individual begins regular smoking earlier in life. Yet, as this report documents, the average age of onset of

regular smoking among women has continuously declined during the last 50 years, and continues to decline.

According to a recent survey by the National Institute of Education, cigarette smoking among adolescent girls now exceeds that among adolescent boys. In the 17–19 year age group, there are almost 5 female cigarette smokers for every 4 male cigarette smokers. The causes of this inversion are far from clear. We do not yet understand the signal events in the initiation of smoking among young women. It is possible that parents set examples concerning lifestyle, health attitude, and risk-taking much earlier in childhood. The beginning of junior high school or entrance into the work force may be equally critical events. We do not know enough about an adolescent's sense of competence and self-mastery, and how these roles differ among women and men. Although smoking patterns among girls correlate with parental, peer and sibling smoking habits, educational level, type of school curriculum, academic performance, socioeconomic status, and other forms of substance abuse, the practical significance of these empirical correlations is unclear.

### Women and the Changing Cigarette

As this report documents, the proportion of men and women smokers using brands with lowered "tar" and nicotine continues to grow. Adolescents of both sexes have followed this trend, to the point where nonfilter cigarettes are relatively rare among young adults.

Although the preponderance of scientific evidence continues to suggest that cigarettes with lower "tar" and nicotine are less hazardous, four serious warnings are in order.

First, the reported "tar" and nicotine deliveries of cigarettes are standardized machine measurements. They do not necessarily represent the smoker's actual intake of these substances. Evidence is now mounting that individuals who switch to cigarettes with lowered "tar" and nicotine inhale more deeply, smoke a greater proportion of their cigarettes, and in some cases smoke more cigarettes.

Second, "tar" and nicotine are not the only dangerous chemical components of cigarette smoke. Many conventional filter cigarettes, in fact, may deliver more carbon monoxide than nonfilter cigarettes.

Third, it has not been established that lower "tar" and nicotine cigarettes have less harmful effects on the unborn fetus and baby; on women and men at high risk for developing coronary heart disease, such as those with elevated cholesterol or high blood pressure; or on workers with adverse occupational

exposures. It has not been established that switching to a lower "tar" and nicotine cigarette has any salutary effect on individuals who already have smoking-related illnesses, such as coronary heart disease, chronic bronchitis, and emphysema.

Fourth, even the lowest yield cigarettes present health hazards for both women and men that are very much higher than smoking no cigarettes at all.

The single most effective way for both women and men smokers to reduce the hazards associated with cigarettes is to quit smoking.

As this report demonstrates, little is known about the effects of these product changes on the initiation, maintenance and cessation of smoking, particularly among women. It has not been determined whether the availability of cigarettes with lowered "tar" and nicotine has made it easier for young women to experiment with and become addicted to cigarettes. It is not known whether smokers of the lowest yield cigarettes are more or less likely to attempt to quit, or to succeed in quitting, than smokers of conventional filtertip or nonfilter cigarettes. The extent to which the act of switching to a lower "tar" cigarette serves as a substitute for quitting may differ among women and men.

**Public Health Responsibilities**

This report, which includes data compiled by individuals from both inside and outside the Government, has confirmed in every way the judgement of the World Health Organization that there can no longer be any doubt among informed people that cigarette smoking is a major and removable cause of ill health and premature death.

Each individual woman must make her own decision about this significant health issue. Secretary Harris has noted that the role of the Government, and all responsible health professionals, is to assure that this decision is an informed one. In issuing this report, we hope to help the public health community accomplish this purpose.

Julius B. Richmond, M.D.
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